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Drymonia macrophylla

Harold E. Moore, Jr.

Two years ago an unknown gesneriad, originally from Costa Rica, flowered at Cornell University. Material sent to Fantastic Gardens, South Miami, Florida by Mr. Jack Reark in 1952 had been most kindly supplied by Mr. R. G. Wilson. Clusters of pale yellow waxy flowers appeared first in leaf-axils of new growth but continued to appear from the same nodes on old wood even when the leaves had dropped.

When the plant was compared with keys and descriptions in Standley's "Flora of Costa Rica" it appeared to be similar in some respects to Drymonia parviflora, a species still known only from the description of Hanstein in 1865. It also agreed with dried specimens from Costa Rica and Guatemala identified as Alloplectus macrophyllus.

From the living material, it was evident that the waxy, broad-limbed corolla inserted obliquely in the large calyx and the most peculiar structure of the anthers were typically those of Drymonia. A re-examination of the status of Alloplectus macrophyllus and similar species placed in Alloplectus was suggested. Their position in Alloplectus seems unnatural and three of them are here transferred to Drymonia. Although Alloplectus still remains a heterogeneous assemblage of species, it does seem possible to define Drymonia with relative precision. In so doing, a combination of characters is used with particular emphasis on the stamens.

When Martius described and illustrated the first Drymonia, D. calcarata from Brazil, he noted that the anthers were not united. In the plate accompanying his text, they were clearly illustrated with sagittate bases. Flowers from living material, however, give a clue to the significance of the anthers. It will be noted that the anthers illustrated as figure 43g are narrowed from a broad apex to a slender, two-lobed base. The locules are borne on the inner face of the anthers, splitting at maturity for only half their length. In life, these anthers are not distinct but are united as in fig. 43h, with their inner faces lightly joined along the upper half of

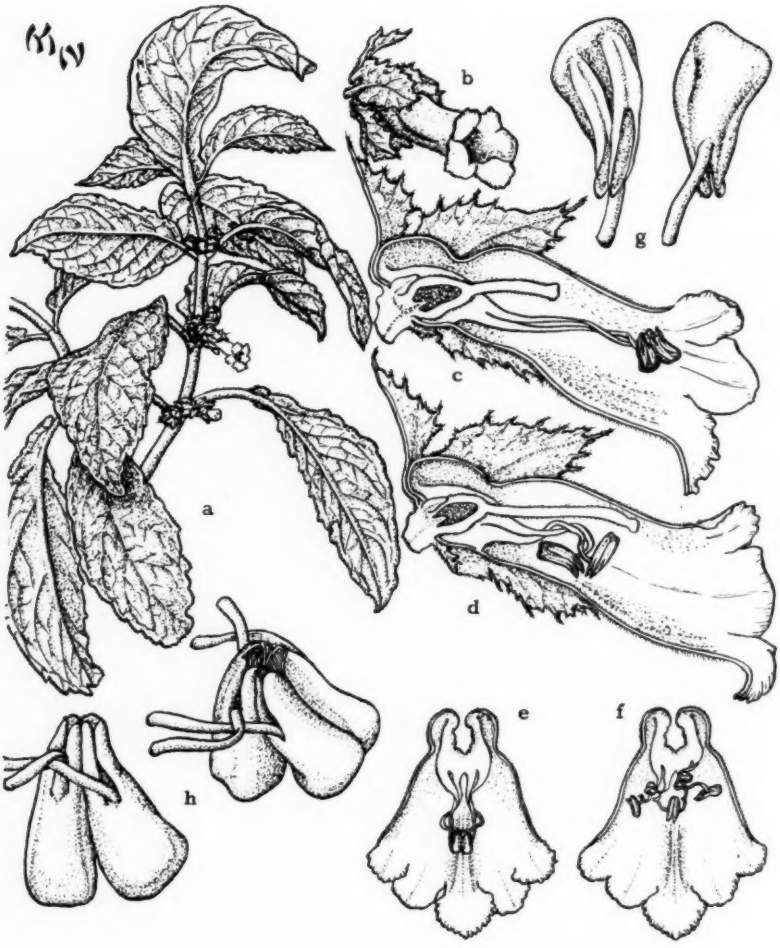


Fig. 43. Drymonia macrophylla: **a**, habit x 1/4; **b**, flower x 1; **c**, flower in vertical section before pollen is shed x 2; **d**, flower in vertical section after pollen is shed x 2; **e**, corolla expanded before pollen is shed x 1; **f**, corolla expanded after pollen is shed x 1; **g**, anthers, ventral and dorsal views x 6 1/2; **h**, anthers showing union, side and three-quarters views x 6 1/2.

the locules, their margins partially joined toward the base. All four anthers form a single unit when the flower first opens. The lower half of the locules open first into each other, then to the outside through two large or four smaller, irregular pores. Most unusual is the fact that the pores are uppermost in position (fig. 43h). The nearly straight filaments exceed the as yet incompletely elongated style (fig. 43c).

After pollen is shed, the stamen-filaments become coiled, withdrawing toward the base of the corolla-tube and separating the hitherto united anthers (fig. 43d). At the same time as the style completes its elongation, the stigma expands and becomes receptive. It may be noted in passing that straight versus contorted stamen-filaments have been used to separate two supposedly distinct species, Drymonia turrialvæ Hanstein and D. marmorata Hooker filius. The difference is not significant in view of the normal change occurring in the stamen condition. Drymonia turrialvæ is the earlier name, then, for a second species of recent introduction to the United States.

Unhappily, no pollinators have been observed on greenhouse plants of Drymonia, but it is easy to conclude that these flowers are highly specialized with regard to pollination. One may assume that an insect pollinator, probing against the bulky apices of the united anthers, tips them sufficiently to spill pollen onto its back. Receptive stigmas of older flowers are ready for pollination in essentially the same position as the anthers of freshly opened blossoms. The presence of a well-developed spur, a supply of nectar, and two lines of red-purple nectar-guides from the lower lip of the flower halfway into the tube, lend credence to such an assumption.

Anthers of typical species of the genus Alloplectus are less specialized. Ordinarily, they are joined by their sides and tips in a square, like those of Columnea and Episcia, shedding pollen freely through longitudinal slits extending the entire length of the locule. The flower is not markedly two-lipped and is nearly erect in the calyx.

A combination of specialized anthers, showy, horizontally inserted, two-lipped flowers sometimes with colored nectar-guides, an oblique calyx of unequal lobes, together with a relatively uniform habit would appear to delimit Drymonia as a genus of unique character in the tribe Columneæ. For the present, only three species definitely known to show this combination of characters are transferred to Drymonia. A handsome colored plate of D. peltata in "Curtis's Botanical Magazine" (Vol. 103, plate 6333 [1877]) illustrates the flower-habit well. The nearly allied D. stenophylla, collected by the writer (no. 6595) at La Virgen in the Sarapiqui valley,

Costa Rica, in 1953 has also been studied. The new names proposed for these three species, plus their synonymy, follow:

Drymonia macrophylla (Oerst.) H. E. Moore, comb. nov.
Caloplectus macrophyllus Oerst., Centralamericas Gesneraceer 45 (1858).
Alloplectus macrophyllus (Oerst.) Hemsl., in Godman & Salvin, Biologia Centrali-Americana (Botany) 2: 484 (1881-82).

Drymonia peltata (Oliver) H. E. Moore, comb. nov.
Alloplectus peltatus Oliver, in Curtis's Botanical Magazine 103: t. 6333 (1877).

Drymonia stenophylla (Donn.-Sm.) H. E. Moore, comb. nov.
Alloplectus stenophyllus Donn.-Sm., in Botanical Gazette 25: 153 (1898).

A genus deserving consideration by the more enterprising plantsman having some cool greenhouse space is the South African Selago (a member of the Selaginaceæ, allied to and sometimes retained in the Scrophulariaceæ). This genus, of about 170 known species, is primarily one of dwarf shrubs or subshrubs (some may be grown as perennials), of heath-like appearance and foliage. As pot plants, most of them flower in late fall and early winter and have the merit of remaining in flower for several weeks.

The flowers are tiny and are produced abundantly in subglobose terminal and axillary clusters about 3 cm. across (often paniculate in over-all appearance). For the most part they are in shades of lavender, red, and purple. The plants may be grown from seed, but are easily propagated by soft-wood cuttings from lateral shoots produced in the spring after the flowering plants have been cut back.

Seeds of Selago Galpinii, S. serrata, S. spuria, and S. Thunbergii have been offered in this country by Rex Pearce and by Pioneer Seed Co. (Dimondale, Mich.). Selago Thunbergii is known to have been grown in California since 1949. The other species appear to be of more recent introduction, although grown in Europe for over a half-century.

G. H. M. L.

Euonymus europæa, E. Hamiltoniana, and Relatives[1]

George H. M. Lawrence

In 1951, Mr. R. A. Blakelock of Kew published in "Kew Bulletin" (pp. 210-290) a comprehensive paper on the systematics of Euonymus, under the very modest title "A synopsis of the genus Euonymus." It includes keys to the subgenera, sections, series, species, and varieties, together with synonymies and references to descriptions. It shows the importance of a world-wide basis in the study of a genus, for Blakelock brought together information and knowledge of all the species and varieties, and was able to appraise relationships to a degree not possible when a study is restricted to the taxa of a limited geographic region. He found that differences alleged to separate some of the so-called species did not exist, especially when a large number of specimens of each taxon was examined. A result of this study is the reduction to varietal status of some names common in horticultural literature. Some of these are reviewed below.

Euonymus europæa Linnæus is distinguished in part by its white, greenish, or yellowish petals, and its yellow anthers; the American E. atropurpurea Jacquin is readily separated by the purple petals. Blakelock accepted 14 varieties of E. europæa. The white-fruited plant is var. alba Weston, the var. linearis of "Hortus Second" is var. angustifolia Schultz, and var. nanus of "Hortus Second" is var. pumila Loudon.

Closely resembling E. europæa in general appearance is the Asiatic and usually pink-fruited Euonymus Hamiltoniana Wallich. The fruits are capsules, and the seeds within are covered with a thin but fleshy aril. Coloration of the fruit (i.e., the exterior of the capsule), of the aril, and of the seed are important diagnostic characters of species and of their variants, many of which occur in nature and are not mere cultigens. Euonymus Hamiltoniana differs further from E. europæa in the purple or dark red anthers of the flowers. Euonymus Bungeana also has purple to red anthers,

[1] The name Euonymus has been treated as feminine by some botanists, as masculine by others. Since the gender was feminine in both classical Greek and Latin, there is no good reason why it should be treated as anything but feminine today.

but may be distinguished by the long petioles of the leaves, and by the leaf-blades which are broad at the base and abruptly narrowed to a long pointed apex.

Euonymus Sieboldiana Blume is treated as a synonym of E. Hamiltoniana, but some of the material so listed in the United States is actually E. kiautschovica Loesener.

Three kinds of Euonymus widely grown here as E. Maackii Ruprecht, E. yedoensis Koehne, and E. lanceifolia Loesener have been reduced by Blakelock to varieties of the little-known E. Hamiltoniana, and are distinguished as follows:

1. Capsule yellow. . . . . .E. Hamiltoniana var. Hamiltoniana[1]

1. Capsule pink to red.

2. Leaves broadly obovate. . . . . E. Hamiltoniana var. yedoensis (Koehne) Blakelock

2. Leaves broadest along basal half, in various degrees of lanceolate to ovate.

3. Leaf-blade lanceolate and acuminate; seeds with aril closed about the seed or only slightly split. . . . . .E. Hamiltoniana var. Maackii (Ruprecht) Komarov

3. Leaf-blade broadly lanceolate to ovate; seeds with aril open enough to expose the rose-colored seed within. . . . . E. Hamiltoniana var. lanceifolia (Loesener) Blakelock

[1] Blakelock did not distinguish the typical form of E. Hamiltoniana as is done here. However, Wallich described the capsule as yellow in his original description of the species. There is also a yellow-fruited form of var. yedoensis (forma calocarpa [Loesener] Blakelock) but it is not known to be cultivated.

A bulletin for which many readers interested in native American plants will be grateful is the U. S. Dept. of Agriculture's Biographical Bulletin No. 23 (June 1954), "Guide to Popular Floras of the United States and Alaska - An Annotated, Selected List of Nontechnical works for the Identification of Flowers, Ferns, and Trees," prepared by Dr. S. F. Blake. Horticulturists and amateur botanists who "are not acquainted with the descriptive terms of systematic botany" will find this a rich source from which to select nontechnical works covering the plant groups or geographical areas which interest them. Each of the 358 titles included is annotated with helpful information on the contents, and prices (or a note that the work is out of print) and sizes are also given - the last a useful bit of information for those who desire a book easily carried in hand or pocket. "General publications" are grouped first, the rest being classified according to the geographical regions or states which they cover. A few technical works have been included for the broader regions, as well as some standard works on cultivated plants, weeds, edible plants, etc. Works concerning only a single plant-family (e.g., the Orchidaceæ) have generally been omitted. This bulletin is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 25 cents.

Notes on Cultivated Labiates
7. Dracocephalum

Gordon P. DeWolf, Jr.

Previously (Baileya 3: 99-107) I have dealt with the genus Nepeta and discussed the criteria which distinguish it from Dracocephalum. In the present article I should like to deal with the genus Dracocephalum as regards its history and composition, and also to discuss, briefly, the alleged genus Lallemantia.

The genus Dracocephalum, as delimited by Linnæus in 1753, was composed of 11 species, 9 of which were undoubtedly closely related. Of the remaining two taxa, one was the plant now known as Physostegia virginiana, and the other was Cedronella canariensis. Of the 9 related species, two taxa have subsequently been segregated into a genus which has been generally called Lallemantia.

The name Dracocephalum is an orthographic variant of "Dracocephalon," a latinized Greek word meaning "Dragon's Head." Dracocephalon was used by Jakob Breyne, in his "Prodromus fasciculi rariarum plantarum anno 1679 in hortis celeberrimis Hollandiæ observatarum..." published in Danzig in 1680. It was subsequently taken up by Tournefort in his "Institutiones Rei Herbariæ," for the plant we now know as Physostegia virginiana. In the third edition of the "Institutiones..." Tournefort also had a genus which he called Moldavica, based on the plant we now know as Dracocephalum Moldavica. In it he also included the plant which is now called Cedronella canariensis.

Linnæus, in 1753, combined the Tournefortian genera Dracocephalon and Moldavica and called the resulting genus Dracocephalum. To the species enumerated by Tournefort, Linnæus added 6 species discriminated by earlier botanists, but not previously placed in this alliance, and two species described by himself, based on collections made by J. G. Gmelin in Siberia. With the exception of Dracocephalum virginianum (Physostegia virginiana) and D. canariense (Cedronella canariensis) these are all species of Dracocephalum in the broad sense.

Since the name Dracocephalum is historically connected with the plant that we know as Physostegia and since D. virginianum (Physostegia virginiana) was the species listed first in the "Species

Plantarum" under Dracocephalum, there has in the past been some agitation to reject the name Physostegia, take up the name Dracocephalum virginianum for the plant in question, and resurrect the name Moldavica for the rest of the species. A fuller discussion, based on a previous discussion by McClintock, is to be presented in "Gentes Herbarum." In brief, I am retaining the name Dracocephalum in its traditional sense for the following reasons: (1) because 9 of the 11 species originally proposed by Linnæus are congeneric (at least in the broad sense) and these include the two species described by him, and (2) to take up another name for the traditional Dracocephalum would necessitate changing somewhat over 100 names, many of them of well-known or relatively well-known garden plants.

I have discussed the distinctions between Nepeta and Dracocephalum in the previous issue of "Baileya." To recapitulate briefly, however, Dracocephalum is distinguished by the thickening at the base of the sinus between the calyx-teeth, and by the apiculately toothed or divided floral bracts. It will be noted that this definition would include within Dracocephalum those few species which have been, in the past, segregated into a genus called Lallemantia. While I am not making a formal reduction of this genus to synonymy with Dracocephalum at this time, I believe that fuller study will indicate the advisability of this course. Lallemantia is distinguished from Dracocephalum only by the presence of a sort of "accordion pleat" in the upper lip of the corolla which encloses the stamens. Since the corolla in this group of genera is somewhat variable, and since this appears to be the only distinguishing feature, it seems to me highly questionable to segregate species from their obvious relatives on such a trivial character.

The combined key that follows distinguishes the two genera, Dracocephalum and Nepeta, and the species of each which are known to be cultivated here in America.

1. At least some of the sinuses at the bases of the calyx-teeth with a thickened "shoulder"; frequently at least the posterior median calyx-tooth expanded; floral bracts generally pinnately lobed or parted. . . . . DRACOCEPHALUM
   2. Leaves cut more than halfway to the midrib.
      3. Plant prostrate; leaves pinnately cleft (fig. 44A). . . . . D. botryoides
      3. Plant erect.
         4. Anthers and filaments hairy. . . . . D. austriacum
         4. Anthers glabrous, filaments somewhat hairy.
            5. Calyx bilabiate, 3/2 (fig. 48Ac). . . . . D. bipinnatum
            5. Calyx-teeth subequal, calyx-mouth oblique (fig. 47d).
               6. Leaves pinnately parted (generally flowering in August).
                  7. Inflorescence of distant verticils, calyx and corolla very short-pubescent. . . . . D. tanguticum
                  7. Inflorescence dense and spike-like, calyx and corolla densely long-pubescent. . . . . D. Forrestii

6. Leaves pedately parted (generally flowering in June). . . . D. Isabellæ

2. Leaves simple, variously cut or toothed, but not more than halfway to the midrib.

8. Anthers and filaments hairy; leaves linear-lanceolate, entire. . . . . D. Ruyschiana

8. Anthers glabrous, filaments glabrous or hairy.

9. Calyx bilabiate, 1/4 (fig. 44Bc).

10. Inflorescence compact, head-like (fig. 46Ba). . . D. parviflorum

10. Inflorescence elongate, spike-like (fig. 45a).

11. Basal leaves cordate, long-petiolate (fig. 44Ba). . . . . D. grandiflorum

11. Basal leaves not cordate.

12. Leaves subsessile, elliptic, to 1 - 1.5 cm. long. . . . . D. fruticulosum

12. Leaves ovate, petiolate, to 5 cm. long.

13. Corolla hardly exserted from the calyx. . . . . D. thymiflorum

13. Corolla about twice as long as the calyx. . . D. nutans

9. Calyx bilabiate, 3/2 (fig. 48Bc).

14. Corolla glabrous, blue or white; plant annual or biennial. . . . . D. Moldavica

14. Corolla pubescent; plant perennial.

15. Leaves broadly ovate, base cordate; flowers white. . . . . D. heterophyllum

15. Leaves linear, entire or grossly toothed or cleft; flowers blue. . . . . D. bipinnatum

1. None of the above characters present. . . . . NEPETA

16. Calyx-teeth as long as, or longer than, the calyx-tube. . . . . N. ucranica

16. Calyx-teeth shorter than the calyx-tube.

17. Corolla 2-3.5 cm. long.

18. Corolla-tube curved. . . . . N. Stewartiana

18. Corolla-tube straight. . . . . N. sibirica

17. Corolla-tube less than 2 cm. long.

19. The rootstock more or less elongate and woody; inflorescence unbranched, spike-like.

20. Rootstock swollen and globose. . . . . N. raphanorhiza

20. Rootstock not swollen. . . . . N. nervosa

19. The rootstock fibrous.

21. Floral bracts large, equalling or exceeding the calyces; inflorescence spike-like and unbranched. . . . . N. reticulata

21. Floral bracts much shorter than the calyces.

22. Cauline leaves not cordate basally.

23. Stem erect, 60 - 120 cm. tall.

24. Leaves oblong, entire. . . . . N. Hemsleyana

24. Leaves lanceolate, crenate. . . . . N. Nepetella
23. Stems ascending, 30 - 40 cm. tall. . . . . N. ×Faassenii
22. Cauline leaves cordate basally.
25. Inflorescence much branched, its branches strict. . . . . N. nuda
25. Inflorescence-branches not strict.
26. Verticils short-pedunculate, compact, the inflorescence spike-like.
27. Flowers to 1.3 cm. long; leaves to 2 cm. long. . . N. camphorata
27. Flowers to 1 cm. long; leaves to 6.5 cm. long. . . . . N. Cataria
26. Verticils long-pedunculate, inflorescence more or less racemose or paniculate.
28. Plants generally 60-90 cm. tall. . . . . N. grandiflora
28. Plants generally 30 - 45 cm. tall.
29. Stems erect. . . . . N. melissæfolia
29. Stems ascending. . . . . N. Mussinii

In common with many other good-sized genera, Dracocephalum has a rather complex subgeneric classification, in this case worked out primarily by Briquet, the most recent student of the family as a whole. The genus is first divided into subgenera, chiefly on the basis of the presence or absence of hairs on the stamen-filaments; the subgenera are further divided into sections, and the sections into subsections. The type-species for the genus has not yet been agreed upon by botanists, and this and other factors may eventually bring about changes in the nomenclature of these infrageneric divisions as used by Briquet. Since representatives of all his sections are in cultivation, I am following his arrangement in the discussion of the species below primarily to show how such an arrangement works out, and to indicate those characters which are considered of taxonomic importance in this group.

Subgenus Eudracocephalum. Anther-filaments glabrous.

Section Buguldea. Calyx bilabiate, 1/4 (i.e., one large tooth in the upper lip, 4 smaller ones in the lower lip).

Subsection Keimodracontes. Leaves roundish, cut or pinnately divided; verticils in terminal head-like or elongate inflorescences. Branching shrubs with decumbent branches.

Dracocephalum botryoides (fig. 44A) is cultivated. This species, native in the Caucasus, grows on rocky slopes and stream-banks at 2500-3600 m. As grown at Ithaca, it is a villous-hairy subshrub with prostrate branches and erect branchlets which may rise to 15 cm. The leaves are evergreen, ovate in outline, a centimeter or

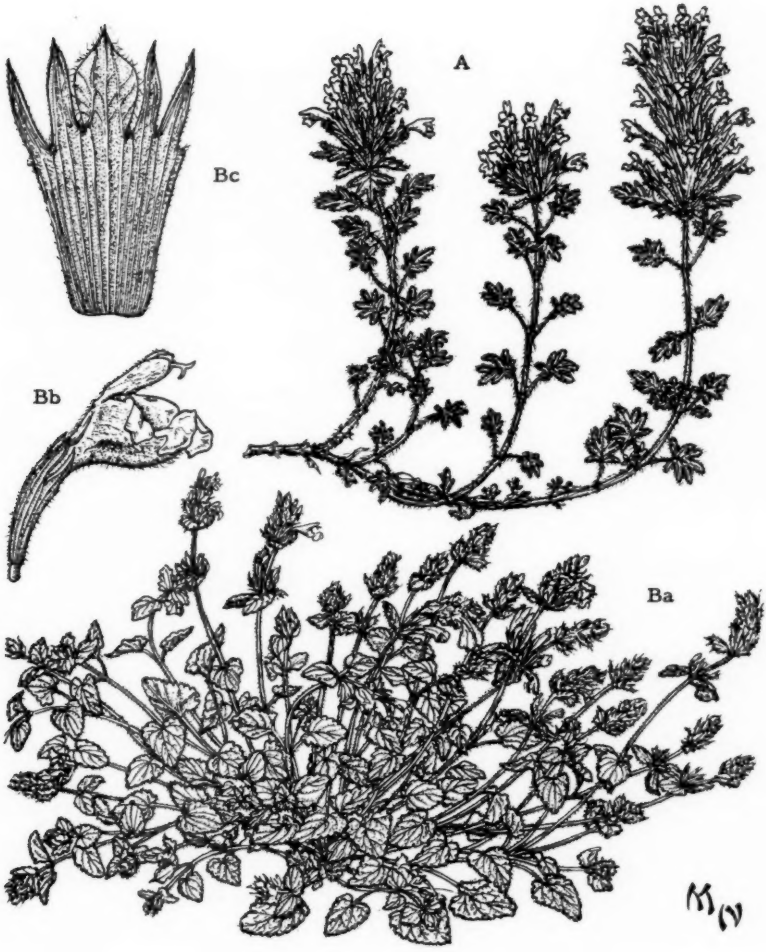


Fig. 44. A, Dracocephalum botryoides, habit x 4/5. B, D. grandiflorum: a, habit x 1/4; b, flower x 1; c, calyx expanded x 2.

more in diameter, and deeply 3 - 5 cleft. Each plant forms a compact, gray-green mat 15 - 30 cm. in diameter in full sun and would be desirable in the rock garden for this alone. We have been unable to flower this species here at Ithaca - though the plants grow vigorously. Floral notes, taken from herbarium material and published descriptions, indicate a dense-flowered, spike-like inflorescence to 4 cm. long, produced in early June. The corollas are about 1.5 cm. long, half again as long as the calyx, and a lavender-pink color. None of the other half-dozen or so species of this subsection seem to be in cultivation.

Subsection Calodracontes. Leaves elongate, entire margined or toothed; verticils in terminal head-like or spike-like inflorescences.

Dracocephalum grandiflorum (fig. 44B) is widespread in Siberia and in the Altai. It was detected in Siberia by J. G. Gmelin between 1733 and 1743 and published in the third volume of his "Flora Sibirica" in 1768. However, Gmelin apparently had been in correspondence with Linnæus earlier, for Linnæus published the species in the first edition of his "Species Plantarum" in 1753. A plant of D. grandiflorum growing in the Hortorium garden forms a dense mound of dark green cordate leaves on long petioles. Our clump measures about 30 cm. in diameter and the "depth" of the clump is 15 cm. or more. In early June the flowering stems elongate and carry their inflorescences 20 - 30 cm. above the rosette leaves. As they mature, the stems tend to be decumbent. The flowers are an intense dark bluish-violet, 3.5 cm. long. A few belated stems may flower again in August and in September. This, also, is an extremely desirable species, either for a large rock-garden or even the front of the perennial border. Dracocephalum speciosum and D. bullatum are closely related species from the Himalayas. Neither appears to be in cultivation in this country. Seedlings of what is reputed to be D. speciosum are still surviving from seed sown this spring in the Hortorium garden. Since herbarium material from the Himalayas indicates that the species grows at elevations of 4,000 - 5,000 m. in full sun, it would appear that the plants are suffering from the heat with us.

Subsection Idiodracontes. Leaves elongate, entire-margined or crenate; verticils distant, standing in leaf-axils, the subtending leaves not differentiated into bracts, or the uppermost leaves smaller than the foliage leaves.

The name D. fruticulosum is in the trade, but material that I have seen bearing this name has proved to be Nepeta Stewartiana.

The true Dracocephalum fruticulosum is apparently a tiny thing, with elliptic leaves scarcely half an inch long.

Dracocephalum nutans and D. thymiflorum are closely related annual or biennial species from northern Europe and Asia. Dracocephalum thymiflorum produces a basal mound of ovate-lanceolate, lightly crenate leaves, from which the densely flowered inflorescences may rise to a height of 75 cm. or even more. The calyces are 6 - 8 mm. long and the bluish corollas are hardly exserted from them. This species is distributed all across northern Europe and Asia. Dracocephalum nutans (fig. 45) is similar, but differs principally in that the corolla is about twice as long as the calyx (fig. 45b).

Fig. 45. Dracocephalum nutans: a, habit x 1/2; b, flower x 4; c, calyx expanded x 4.

Sub-section Cryptodracontes. Leaves elongate, crenate-dentate; verticils in head-like, terminal inflorescences; flowers small, corolla hardly longer than the calyx; erect branching herb.

Dracocephalum parviflorum (fig. 46B) is an annual or biennial species to 8 dm. tall, with bluish or violet corollas. It grows naturally in rocky or gravelly soil, ranging from Quebec to the Yukon and southward to New York and Arizona.

Section Moldavica. Calyx 2-lipped, 3/2 (i.e., 3 teeth in the upper lip, 2 teeth in the lower lip).

Subsection Stenodracontes. Leaves elongate, entire-margined or serrate; verticils in terminal, more or less elongate, often leafy inflorescences. Stamens and style not, or hardly, exserted. Stems ascending or erect.

Dracocephalum Moldavica (fig. 48B), native from eastern Siberia to the Himalayas, is known as a weed or escape from cultivation over much of Europe and in some places in the United States. It grows to 60 cm. tall, with narrowly lanceolate, inciso-crenate or dentate leaves to 4 cm. long. The flowers, which are about 2 cm. in length, are borne in the axils of only slightly reduced floral leaves and are generally blue, although a white-flowered form is known. The floral bracts are strongly aristate.

Dracocephalum heterophyllum is a species distributed from China through Tibet, to Turkistan. It is a low, spreading plant, to perhaps 45 cm. tall, forming a clump 60 cm. in diameter. The branches are generally decumbent. Leaves are oblong-ovate, cordate, to 5 cm. long. The flowers are white, 2.5 - 3 cm. long, borne in leafy spike-like inflorescences. Kingdon Ward records that the mature inflorescences are "deliciously aromatic."

Another species of this subsection is D. bipinnatum, more commonly, though incorrectly, known as D. Ruprechtii. Franz Josef Ruprecht published the description of D. bipinnatum in 1869, the year before his death. Eleven years later, Eduard August von Regel redescribed this species on the basis that Ruprecht had based his name on an aberrant specimen. While it is true that most of the material of this species that has been commented upon has the leaves simple, at least some plants have the lower leaves pinnatisect, and some forms apparently match Ruprecht's type. In any event, our present Rules are explicit in stating that a name cannot be changed" merely because it is inappropriate..." (Art. 72).

Dracocephalum bipinnatum is an herb to 40 cm. tall, with branches which tend to be woody at the base. The leaves may be simple, or pinnately parted at the base, to 3.5 cm. long. The

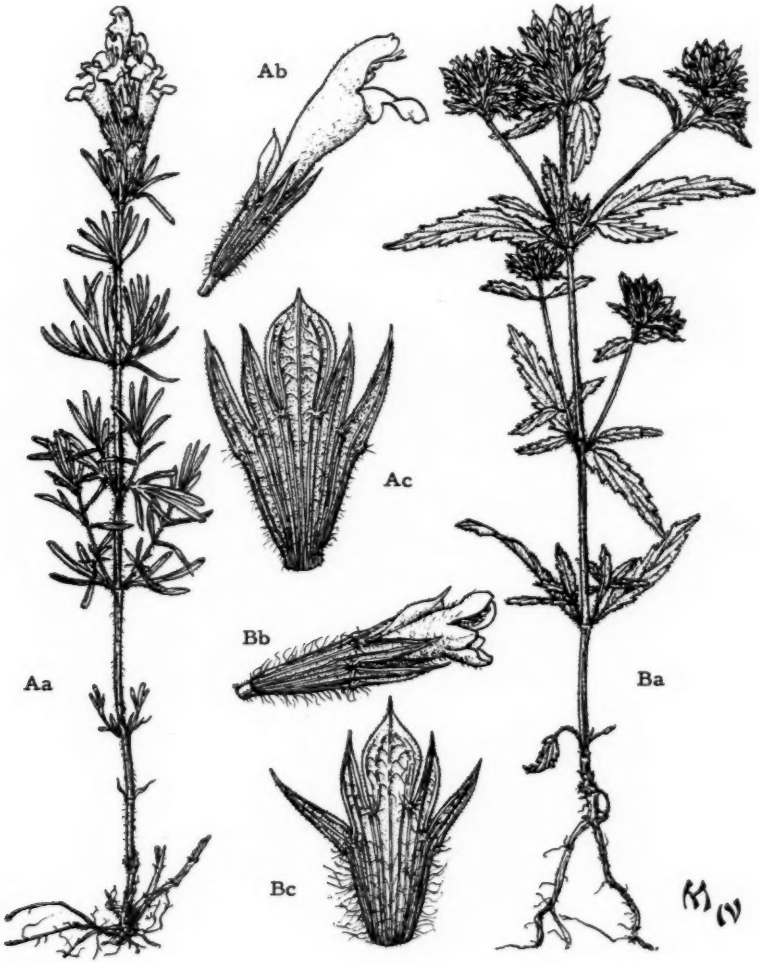


Fig. 46. A, Dracocephalum austriacum: a, habit x 2/5; b, flower x 1; c, calyx expanded x 2. B, D. parviflorum: a, habit x 1/2; b, flower x 3; c, calyx expanded x 3.

flowers are borne in spike-like inflorescences. The corollas are blue, pubescent, as much as 3.5 cm. long, about twice as long as the calyx. This ought to be a desirable garden subject. However, all the cultivated material of which we have record has proved to be Hyssopus officinalis Linnæus.

Apparently related to the species of subsection Stenodracontes are five species native in the eastern Himalayas and in the mountains of western China. Of these five, three are cultivated. These species, which have been accurately discriminated only since the mountains of western China were opened to botany and horticulture through the efforts of George Forrest in the early years of this century, have never been accurately intercalated into the hierarchical system of the genus. While one student has attempted such an intercalation, his placement is in error due to his misunderstanding of Briquet's sectional diagnoses. Actually, this group of species will probably require the erection of a new subsection to accommodate them. Such treatment, however, must await a monographic study of the genus, and is not attempted here. In particular, the species differ from most of the rest of the genus in having the calyx-teeth subequal and the calyx consequently only slightly bilabiate.

Dracocephalum tanguticum (fig. 47) was described as early as 1881 from material communicated to Carl Maximowicz, Chief Botanist of the Botanical Garden at Saint Petersburg (Leningrad), by Nicolai Przewalski who had collected the plants in western Kansu province of China. This is an erect herb, probably growing 30 - 60 cm. tall (I have seen no living plants, and published accounts seem to be silent on this point), with the leaves ovate, pinnately parted, and 3 - 5 (-8) cm. long. The flowers are borne in distant verticils toward the ends of the branches. The corolla in dried material is medium blue, to about 2.5 cm. long, the lower lip lighter, with dark spots.

Dracocephalum Isabellæ (the name was suggested by the collector, George Forrest, to commemorate his sister) was the first of the species segregated from the D. tanguticum complex. This was published in the "Notes from the Royal Botanic Garden, Edinburgh" for 1914. The original collection of this species was made at about 4,000 m., July, 1914 in an "open stony limey pasture on the mountains of the Chungtien plateau." The type collection was a simple-stemmed herb, 30 - 50 cm. tall, densely white-crispate-villous. The leaves are up to 2.5 cm. long and seeming pedately parted into 5 - 7 linear segments. The flowers are borne in a terminal, spike-like inflorescence 8 - 12 cm. long. Corollas are deep violet, 3 - 4 cm. long and covered with purple hairs. This is universally acclaimed as a striking garden subject.

In 1916 W. W. Smith and George Forrest read a paper before the Botanical Society of Edinburgh which was subsequently published in the Transactions of that society, dealing with three more species of

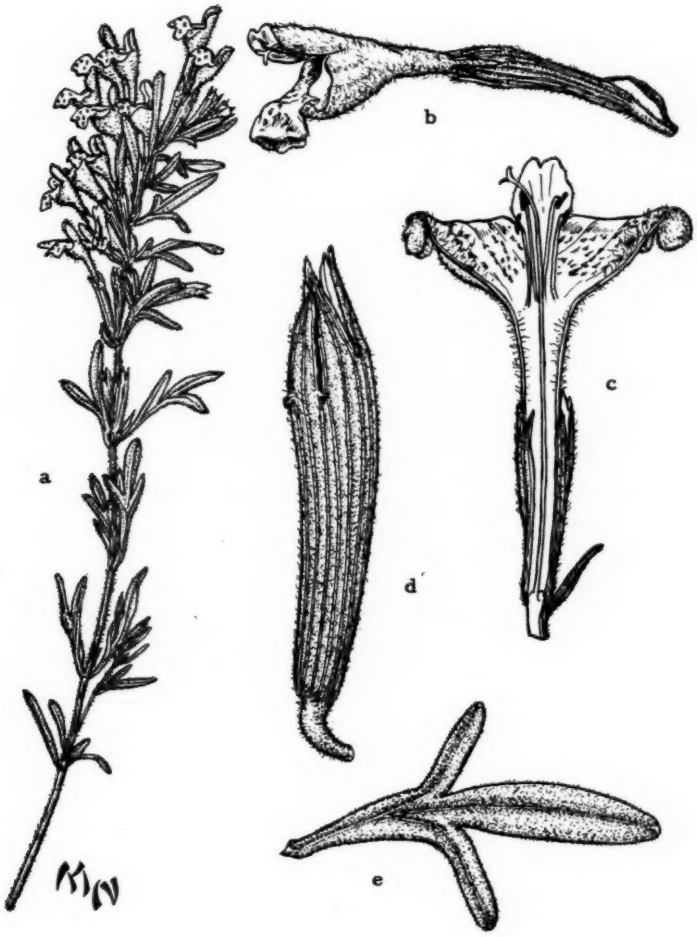


Fig. 47. Dracocephalum tanguticum: a, habit x 4/5; b, flower x 2; c, flower split open and expanded x 2; d, calyx x 4; e, leaf x 2.

the D. tanguticum complex. Of these, only one, D. Forrestii, is alleged to be in cultivation in this country. The name D. Forrestii was based on several Forrest collections, the first of which was made in September, 1904 at about 4000 m. on a "dry grassy bank on the Chungtien plateau between descent of Niu Chang Pass and Hsia Chung Tien, Yunnan."

Dracocephalum Forrestii is a perennial herb with simple or branching stems 15 - 50 cm. tall, more or less white villous. Leaves are ovate, to 3.5 cm. long, pinnately parted with 5 - 7 linear segments. The flowers are carried in a dense, spike-like inflorescence, the floral bracts and white-villous calyces, as in D. Isabellæ, purple-stained. The corollas are deep blue-purple, white villous, and may reach 3 cm. in length. This is also a spectacular garden plant.

I have seen several specimens of what appear to be forms of D. tanguticum which have been grown in the northern part of the United States. I suspect this species is the most adaptable to our hot, dry summers. Dracocephalum Isabellae and D. Forrestii, being strictly high mountain plants, would likely be much more difficult to grow. None the less, to those who can give them suitable conditions, these two species are well worth the trouble!

Subgenus Ruyschiana. Anthers hairy; stem erect, leafy; verticils in terminal, leafy, inflorescences.

Subsection Euruyschiana. Leaves linear-lanceolate, entire-margined.

Dracocephalum Ruyschiana (fig. 48A) and D. argunense are very closely related species, if, indeed, they are not conspecific (as I am treating them for "Hortus III"). Dracocephalum Ruyschiana is widespread through the mountainous portions of western Europe and Russian Asia. It is an erect, glabrescent perennial, to 60 cm. tall. The leaves are linear-lanceolate, to 5 cm. long. The corollas are blue, to 2.5 cm. long, a little more than twice as long as the calyx, in a spike-like inflorescence. It blooms in June. This is perhaps not a spectacular species, but it grows readily and flowers freely, and is generally useful in a large rock-garden or in the front of the perennial border.

The taxon which has been called D. argunense, if it is to be kept distinct at all, is probably best treated as a variety of D. Ruyschiana - in which case the appropriate name seems to be D. Ruyschiana Linnæus var. speciosum Ledebour. It is apparently only a somewhat larger form of D. Ruyschiana, though as such it would be of interest to horticulture. It is said to differ from D. Ruyschiana in that the leaves may reach 7.5 cm. in length and in that the 3 - 3.5 cm. long corolla is a little less than three times as long as the calyx. It is native in northeastern Asia.

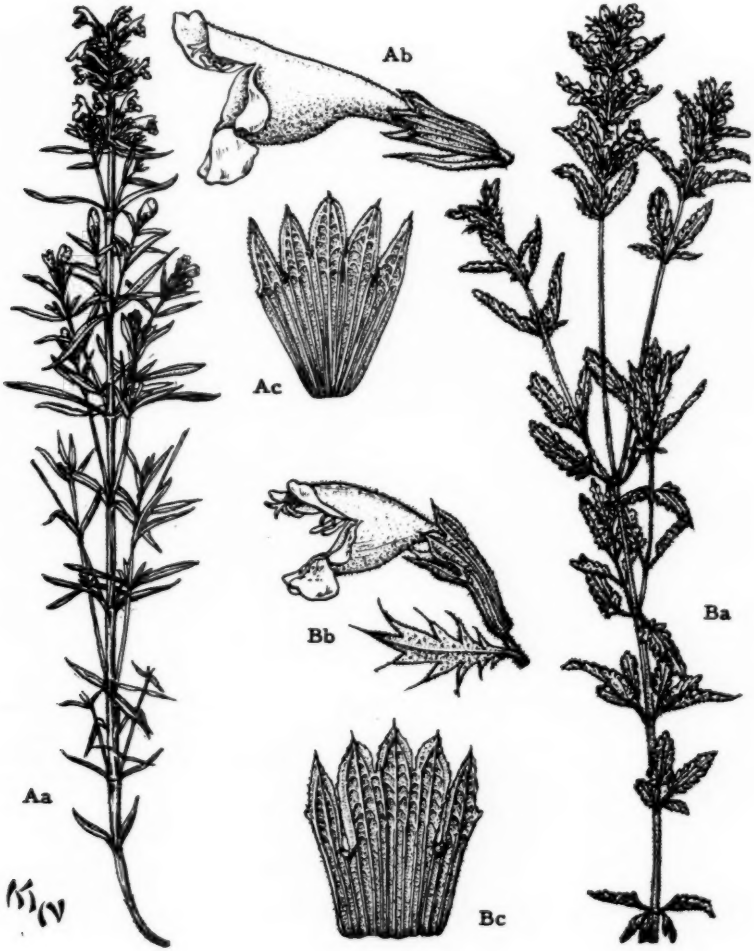


Fig. 48. A, Dracocephalum Ruyschiana: a, habit x 1/4; b, flower x 2; c, calyx expanded x 3. B, D. Moldavica: a, habit x 2/5; b, flower and floral bract x 2; c, calyx expanded x 3.

Subsection Austriaca. Leaves pinnately 3-5-parted, the segments of the cauline leaves linear, with revolute margins.

Dracocephalum austriacum is a puberulent perennial to 60 cm. tall. The corollas may reach 3.5 cm. in length and are light blue. This, like D. Ruyschiana, would seem to be a good garden subject.

The genus Lallemantia

In 1848, in his treatment of the Labiatæ for De Candolle's "Prodromus," Bentham took up a genus published by Fischer and Meyer in a seed list issued from the Imperial Botanic Garden in St. Petersburg in 1839. This genus, Lallemantia, was based on three species, closely allied to Dracocephalum thymiflorum, which differed from the rest of the genus in having the stamens and style enclosed in a sort of "accordion pleat" formed by the upper lip of the corolla. This is, however, the only real distinction between the two taxa. In all other particulars - leaves, floral bracts, calyx, and general habit - the species included in Lallemantia resemble plants in subsection Idiodracontes, discussed above.

Only one species of this taxon seems to be in cultivation in the United States at present. This is Lallemantia canescens (Linnæus) Fischer & Meyer. This is in habit like Dracocephalum thymiflorum, but the foliage is gray-glaucescent and the corollas are bluish-lavender, to 2.5 cm. long. It acts as an annual in Ithaca - but is surely not particularly useful in the garden.

A Checklist of Dracocephalum and Nepeta species likely to be cultivated or listed in the United States follows. Correct (valid) names are underlined, synonyms or incorrect names are not.

Dracocephalum
altaicum: probably an orthographic variant of D. altaiense
altaiense Laxmann :: D. grandiflorum
argunense Fischer ex Link :: D. Ruyschiana var. speciosum
austriacum Linnæus
bipinnatum Ruprecht
botryoides Stephan
bullatum G. Forrest ex Diels
canariense Linnæus :: Cedronella canariensis (Linnæus) Willdenow
diothiocum: listed name of no botanical standing
Forrestii W. W. Smith
fruticulosum Stephan ex Willdenow
grandiflorum Linnæus
Hemsleyanum (Oliver ex Hemsley apud Prain) Prain ex Marquand :: Nepeta Hemsleyana
heterophyllum Bentham
Isabellæ G. Forrest ex W. W. Smith
japonicum Kudo :: D. Ruyschiana var. japonicum

Dracocephalum (continued)
Mairei Emberger
Moldavica Linnæus
nutans Linnæus
parviflorum Nuttall
Ruprechtii Regel :: D. bipinnatum
Ruyschiana Linnæus
var. speciosum Ledebour
var. japonicum A. Gray
sibiricum Linnæus :: Nepeta sibirica
speciosum Bentham
Stewartianum (Diels) Dunn :: Nepeta Stewartiana
tanguticum Maximowicz
thymiflorum Linnæus
virginianum Linnæus :: Physostegia virginiana (Linnæus) Bentham

Nepeta
camphorata Boissier and Heldreich
Cataria Linnæus
× Faassenii Bergmans ex Stern
Glechoma Bentham :: Glechoma hederacea Linnæus
grandiflora Bieberstein
hederacea (Linnæus) Trevisan :: Glechoma hederacea Linnæus
Hemsleyana Oliver ex Hemsley apud Prain
macrantha Fischer ex Bentham :: N. sibirica
melissæfolia Lamarck
Mussinii Sprengel ex Henckel
Nepetella Linnæus
nervosa Royle ex Bentham
nuda Linnæus
pannonica Linnæus :: N. nuda
× pseudomussinii Floto (illegitimate name) :: N. × Faassenii
raphanorhiza Bentham
reticulata Desfontaines
sibirica Linnæus
Stewartiana Diels
ucranica Linnæus

DERIVATION OF THE GENERIC NAME MORÆA (IRIDACEÆ)

Bailey's "Manual of Cultivated Plants," ed. 2 (1949), indicates that this generic name commemorates J. Moræus, Swedish physician, father-in-law of Linnæus. Chittenden, in the more recent "R. H. S. Dictionary of Gardening," stated that it was thus named "in honour of R. Moore, English botanist." Chittenden is essentially correct.

The genus was established and named in 1758 by Philip Miller, master horticulturist and head of the Chelsea Physic Garden, now a part of southwest London. As was pointed out by the late N. E. Brown (Journal of the Linnæan Society, Botany 48: 40-41 [1928]), Miller described and illustrated a plant that he named Morea "in honour of Robert More Esquire of Shropshire." Linnæus, in 1762, accepted Miller's genus but changed the spelling to Moræa. No reason was given by Linnæus for this unjustifiable change of spelling. Brown noted, "It is probable that the similarity of the name Morea to his wife's maiden name Moræus led to his misspelling it." The Linnæan spelling has since been conserved and Moræa by legislation has thus been decreed as correct.

G. H. M. L.

THE CORRECT SPELLING OF CLERODENDRUM

In some of the botanical and much of the horticultural literature, the genus of subtropical shrubs and vines properly known as Clerodendrum (Verbenaceæ) has the generic name spelled Clerodendron. The reasons for the correctness of the ending "-um" deserve to be set forth.

Linnæus, who first named the genus, used the spelling Clerodendrum in the first six editions of his "Genera Plantarum" and in all editions of his "Species Plantarum." Willdenow likewise accepted this spelling in the fourth edition of the "Species Plantarum," of which he was editor. The first change in spelling occurred in the "Vienna reprint" of Linnæus' "Genera Plantarum" in 1767. There the ending "-on" was substituted. W. D. Jackson, editor of the basic volumes of "Index Kewensis," was in error when he ascribed the "-on" termination to the first edition of Linnæus' "Genera Plantarum" (1737). This is probably the main source of the erroneous spelling Clerodendron, since most persons accept as infallible the spellings adopted in "Index Kewensis."

It is of further interest that Linnæus wrote the name with "-um" on his herbarium sheets, but that, on the folder enclosing them and on sheets added later (presumably by his son), the "-on" ending was used. Thomas, in his monograph of the African species (1936), used the spelling of Clerodendrum, as has Moldenke consistently in his accounts of the genus. In the second edition of the "Manual of Cultivated Trees and Shrubs" (1941), Rehder accepted the ending "-on" in place of "-um" as used by him previously. Bailey used the "-um" termination, as did Chittenden (1951) in the R. H. S. Dictionary. The spelling Clerodendrum will be used in "Hortus III."

G. H. M. L.

Notes on Lapeirousia in Cultivation

George H. M. Lawrence

The genus Lapeirousia is not so common in American gardens as perhaps should be the case, largely because it is a warm temperate plant, native to tropical and south Africa and, although corm-producing like the Gladiolus, is not spectacularly showy. Eight of the 50 or more species of the genus are offered in the American trade.

The generic name Lapeirousia originated in 1788 with its publication by the French botanist, Pierre Pourret (1754-1818), who recognized two species, until then passing as Gladiolus, as not belonging to this last-named genus. In seeking a name for his new genus, Pourret chose one commemorating the famous French nobleman and savant of the natural history of the Pyrenees, Baron Philippe Picot de la Peirouse (1744-1818) (not Count Jean Francois Galoup de la Peyrouse, as cited in the "R. H. S. Dictionary of Gardening." Lapeirousia was based on a specimen collected by Thunberg in the Cape Province, South Africa, and in 1781 named Gladiolus junceus by Linnæus filius. Pourret renamed this Lapeirousia juncea.

The generic name Lapeirousia is commonly, but not originally, spelled Lapeyrousia. The International Code of Nomenclature provides that the original spelling of a name shall be retained unless it is an orthographic error. In this case, Pourret used the spelling Lapeirousia consistently, but the artist did misspell the name "La Peyrousia" when engraving it on Pourret's plate. Furthermore, Baron de la Peirouse appears not to have been consistent in his own spelling of his surname and in later years used the "y" in place of "i." This, however, does not affect the spelling adopted by Pourret.

The generic name Anomatheca, sometimes used for members of this genus, originated with its publication, in 1804, by John Bellenden Ker, who was then editor of "Edward's Botanical Register." He based his new genus on the same species that had been selected by Pourret as his Lapeirousia, but Ker renamed it Anomatheca juncea. The name Anomatheca was superfluous when published, and is illegitimate. It is only a synonym, and all species known to have been included in it are now considered to be species of Lapeirousia.

Studies in connection with the treatment of Lapeirousia for "Hortus III" show that all writers of horticultural accounts of the last quarter-century apparently have overlooked the work by the late N. E. Brown of Kew (Journal of the Linnæan Society, Botany, 48: 19-20 [1928]), based on his studies of Thunberg's types of South African Iridaceæ. From his paper it becomes clear that confusion has long existed in the identity of the plant known as Lapeirousia anceps, and that Brown himself added to it.

The history of the name Lapeirousia anceps begins with Linnæus' son, usually referred to as Linnæus filius, who, in 1781, named a plant collected by Thunberg Gladiolus anceps. This plant has, according to Baker,

> two-edged stems more or less denticulate along the edges, crisped edges to the leaves, and long-tubed pale lilac-tinted flowers with purple spots on the lower segments...

In 1790, the Austrian botanist and horticulturist, Nicolaus Jacquin, described and illustrated a plant he believed to be Linnæus' Gladiolus anceps. He noted, however, that it differed from Thunberg's plant (again, I quote Brown) in

> the edges of its stem being usually without teeth, leaves not or but slightly crisped at the edges, and the flowers very much smaller and of a dark purple or violet-purple colour, with segments less than half an inch long.

Fourteen years later, John Bellenden Ker, an English botanist, recognized Jacquin's plant to be a member of the genus Lapeirousia which had recently been set up by Pourret and, on the basis of Jacquin's description and plate, he made the transfer and named the plant Lapeirousia anceps. (Though he actually spelled it Lapeyrousia, the correct spelling Lapeirousia will be used when reference is made to it in this article.) When the late N. E. Brown studied Thunberg's specimen, which is the type of the Linnæan Gladiolus anceps, he found it was not identical with the plant described and figured by Jacquin. This made Jacquin's name of Gladiolus anceps a later homonym - a name that has been applied to two different plants.

Under ordinary circumstances, when a species is transferred from one genus to another it retains its original specific epithet in combination with the new generic name. In this case, both the plant known to Linnæus and the other known to Jacquin (in each instance as Gladiolus anceps) are properly members of the genus Lapeirousia. They must have two separate binomials in this genus. The first transfer was made by Ker in 1804, when he formed the name

Lapeirousia anceps, based on Jacquin's plant. Inasmuch as Jacquin's Gladiolus anceps was an illegitimate name by modern rules, Ker's Lapeirousia anceps must be treated as a new name, dating from 1804. This, because one may not use an illegitimate name when making a new combination. Though Ker thought he was making a new combination (combining the specific epithet anceps, used by Jacquin, with the generic name Lapeirousia), in reality it was a new name. The name of Linnæus must not be used as a parenthetical author since his plant, being different, does not enter into this situation. Much later, J. G. Baker of Kew described and treated the Thunberg plant as Lapeirousia anceps (also using the erroneous spelling Lapeyrousia). He credited the name to Ker, cited Linnæus' name (Gladiolus anceps) and place of publication in synonymy, but provided a description of the Thunbergian specimen rather than that of Jacquin. By so doing, Baker in effect created a new name, for the plant of Thunberg and Linnæus, but it was a later homonym (Lapeirousia anceps Baker, not Lapeirousia anceps of Ker). This action by Baker, although based on the first usage of the epithet anceps, was the second time the binomial Lapeirousia anceps had been made in Lapeirousia and as such it is illegitimate.

When N. E. Brown in 1928 clearly, and for the first time, separated the two species until then passing under the single name Lapeirousia anceps, he compounded the confusion by renaming as L. Jacquinii Ker's legitimately named Lapeirousia anceps! He should have left Ker's name as it was, for this plant, but should have taken up the next available name for the Thunbergian plant which Baker had described under the name Lapeirousia anceps.

The name Lapeirousia compressa enters into this situation, also. Some botanists have considered it to be a synonym of L. anceps. Pourret, the author of the name L. compressa, stated that the plant so named was sent to him from the Isle of Mauritius by Commerson. I have not seen Pourret's specimen (believed to be in the herbarium at Madrid), but a study of his figure, presumed to be based on it (in Memoires, Academie de Toulouse, vol. 3, plate 6 [1788]), and of his description, shows that his plant agrees with Baker's Lapeirousia anceps (based on Thunberg's specimen) as concerns characters of the stem, foliage, and bracts, but differs in having flowers with the perianth-tube about as long as the outer bracts (and was described by him as pale blue in color, striped with longitudinal lines of dark blue that do not extend to the segment margins). Because of these differences, and because of the distinctiveness of the flora of Mauritius from that of South Africa, Lapeirousia compressa is to be treated as a distinct species in "Hortus III." Material under this name in the trade, however, may be the South African L. anceps Ker.

From his original description and accompanying citation of Gladiolus denticulatus, it is clear that the plant so-named by Lamarck in 1786 is conspecific with Linnæus filius' Gladiolus anceps, the basonym of the illegitimate Lapeirousia anceps Baker. Gladiolus denticulatus is the next oldest name to be encountered for plants of this relationship, and the plant bearing this name is actually a Lapeirousia. Since the epithet anceps already has been used for a different species in Lapeirousia (that of Ker and Jacquin), it appears that the epithet denticulata must be taken up for the species represented by the Thunberg plant, and a new combination must be made. It is not known at the time of this writing whether a specimen determined as Gladiolus denticulatus by Lamarck now exists. It is to be sought in the herbarium at Paris. If so, it is the type for the species, and the Thunberg specimen, while of historical interest as being conspecific with that of Lamarck, is no longer a type. The correct names of these two species, and the pertinent synonymy for each, is as follows:

Lapeirousia anceps Ker in König and Sims, Annals of Botany 1: 238 (1804), "Lapeyrousia."

Gladiolus anceps Jacquin, Collectanea ad Botanicum ... 4: 163 (1790), not G. anceps Linnæus filius (1781).
Lapeirousia Jacquinii N. E. Brown, in Journal of the Linnæan Society, Botany 48: 21 (1928).

Lapeirousia denticulata (Lamarck) Lawrence comb. nov.

Gladiolus anceps Linnæus filius, Supplementum Plantarum... p. 94 (1781), not Lapeyrousia anceps Ker (1804).
Gladiolus denticulatus Lamarck, Encyclopédie Méthodique 2: 728 (1786).
Ovieda anceps Sprengel in Linné's Systema Vegetabilium... 1: 147 (1825).
Peyrousia aculeata Sweet, Hortus Britannicus... p. 396 (1827).
Ovieda aculeata (Sweet) Klatt in Linnæa 32: 777 (1863).
Lapeyrousia anceps (Linnæus filius) Baker in Journal Linnæan Society, Botany 16: 156 (1877) pro parte; not L. anceps Ker (1804).
Lapeyrousia anceps Baker var. L. aculeata (Sweet) Baker in Journal of the Linnæan Society, Botany 16: 156 (1877).

In the above, Baker's L. anceps var. aculeata is not considered taxonomically distinct from L. denticulata. I have not seen abundant material of this variant but the characters by which it was alleged to be distinct do not seem to exist. They are:

> The outer spathe-valve denticulate down the keel; perianth limb 1/2 - 3/4 in. long, with broader segments. [Baker, in Flora Capensis 6: 94 (1896)]

Brown revealed a second taxonomic problem when he discovered that Thunberg's type specimen of Gladiolus laxus "is only a.... specimen of Lapeyrousia cruenta Baker." Baker's name of 1892

was based on Lindley's earlier name, Anomatheca cruenta, given the plant in 1830. Although no horticultural writer is known to have noted and followed Brown in this discovery, his observation was followed by Dr. Ludwig Diels in the latter's revision of the Iridaceæ, in volume 15a of the second edition of Engler & Prantl's "Die Natürlichen Pflanzenfamilien," p. 488 (1930).

The correct name and synonymy for this third species is as follows:

Lapeirousia laxa (Thunberg) N. E. Brown, in Journal of the Linnæan Society, Botany 48: 24 (1928).

Gladiolus laxus Thunberg, in Flora Capensis (edit. J. A. Schultes), p. 50 (1823).

Anomatheca cruenta Lindley, Botanical Register 16: plate 1369 (1830).

Lapeyrousia cruenta (Lindley) Baker, Handbook of Irideæ, p. 173 (1892).

This change in the name of a well-known garden member of the genus is not an example of a botanist's digging among old or little-known botanical works and "coming up" with an earlier and heretofore unknown binomial. It is an example of the need of careful study of the type-specimens on which species are based. Thunberg's specimens of Iridaceæ, collected by him in South Africa in 1772-1775, have been available for study in the herbarium at Uppsala, Sweden, for nearly two centuries. It is to be regretted that J. G. Baker and other early students of the family did not study them. The finding, by N. E. Brown, that Thunberg's specimen of Gladiolus laxus is of the same species of Lapeirousia to which Lindley later had given the specific epithet cruenta, is a matter of correct reidentification of Lindley's plant. It is not a matter of nomenclature.

In the course of this study, an interesting situation was revealed. I learned that, since 1935, the name Anomatheca cruenta has been used by ten domestic and thirty-seven foreign trade sources for the most commonly cultivated species (Lapeirousia laxa), and that the correct generic name, Lapeirousia ("L. cruenta"), has been adopted by seven domestic and sixteen foreign trade sources. Whether by intent or inadvertance is not known, but three domestic and five foreign sources have offered it under both generic names. Tradesmen should treat the generic name Anomatheca as a synonym of Lapeirousia. Offerings of Anomatheca cruenta should be carried as Lapeirousia laxa and those of Anomatheca juncea as Lapeirousia juncea.

Key to the Cultivated Species of Lapeirousia

1. Perianth-tube 2 to 5 cm. long or longer, very slender.
   2. Basal leaf 1.
      3. Infl. spicate, 8 to 13 cm. tall, the bracts spirally congested and falcate; anthers purple; basal lf. flat. . . .L. fissifolia (Jacquin) Ker
      3. Infl. paniculate, 15 to 30 cm. tall, the bracts not spirally congested, ovate; anthers yellow; basal leaf-margins wavy or crisped. . . . . .L. denticulata (Lamarck) Lawrence
   2. Basal lvs. usually 2 or more.
      4. Segms. of perianth 1/2 as long as tube; basal lvs. mostly 6; infl. spicate, fls. bright red to white. . .L. laxa (Thunberg) N. E. Brown
      4. Segms. of perianth about 1/3 as long as tube; basal lvs. mostly 2; infl. 2 to 3 branched, fls. purple to magenta or bluish-white.
         5. Fls. dark purple to magenta, marked with white, perianth-tube 6 to 12 mm. longer than outer bracts. . . . . .L. anceps Ker
         5. Fls. pale bluish-white, the segms. with dark longitudinal stripes that do not reach the margins. . . . . .L. compressa Pourret
1. Perianth-tube 0.5 to 1.5 cm. long (rarely to 2.0 cm. long in L. corymbosa).
   6. Stamens about as long as perianth-segms.; fls. produced in large numbers on the infl.
      7. Plants 3 to 5 dm. tall, infl. brs. acutely angled; basal lvs. 2, linear, erect. . . . . .L. Sandersonii Baker
      7. Plants 1.5 to 2.5 dm. tall, infl. brs. flattened; basal lf. 1, ensiform and falcate. . . . . .L. corymbosa Ker
   6. Stamens 1/2 as long as perianth-segms.; fls. 4 to 8 in each spicate br.
      8. Fls. whitish, in paniculate infl.; basal lf. 1. . . . . .L. divaricata Baker
      8. Fls. pale pink to rose-red, the lower 3 segms. each with dark red basal blotch, in curved spicate infl.; basal lvs. 4 to 8. . . . . .L. juncea (Linnæus filius) Pourret

A CORRECTION

The name of the genus Onosma (Boraginaceæ) is neuter in gender, and is commonly so treated (viz., Onosma tauricum). However, in my article "On the Gender of Scientific Plant Names" ("Baileya," vol. 3, no. 2, p. 62 [March, 1955]), Onosma was given as an example of a feminine Greek-derived name ending in "-ma." In this I was in error. Diosma and Barosma would have been better examples, for they are feminine "modern" compound names derived in part from the feminine Greek noun "osme," meaning "smell." Onosma, though also derived originally from "osme," was a plant name used by the ancient Greeks (and not a modern compound) and was considered a neuter name by them. Onosma, then, should be treated as neuter by us also.

W. J. D.

The Cultivated Alliums III[1]

Harold E. Moore, Jr.

Two previous articles in this series have dealt with the genus Allium and its subdivisions, with a small group of broad-leaved alliums adapted to woodland or shady border plantings, and with a number of rhizomatous alliums with leaves that remain green throughout the growing season.

The remaining three groups of alliums among those lacking open nectaries in the septs of the ovary are characterized by the development of a well-formed tunicated bulb. They often occur in regions where the dry season is prolonged, as in the lands bordering the Mediterranean Sea, the dry plateaus of Asia Minor and Asia, or parts of the western United States and Mexico. After an early flush of growth, the leaves wither, the plants flower, and soon the only vestige of their presence is the dry fruiting stalk which, in species such as Allium Christophii, may be ornamental in itself.

Rhizomes are by no means unknown in the bulbous alliums but they are usually vertical or inclined, slender, and of short duration. The function of storage has been taken over by the bulb. In some species, bulblets form at the base of or within the coats of the bulb. Other species have umbels in which the flowers are replaced by bulbils. Rarely attractive, the last type often becomes weedy, requiring some caution in its use on the part of the gardener.

In cultivation, the bulbous alliums can be treated in the same manner as other bulbous plants. They may be used effectively in nearly any location where they receive sufficient light. Smaller species are excellent for the rock-garden. Taller species may be massed or spotted individually in the border or perennial garden, depending on their size and color. The majority are hardy or semi-hardy in the north and their frequently bright or rich color enhances any planting.

Aside from having a bulb, these alliums are not all alike in other respects. They may be divided into three groups that are relatively easy to distinguish. For contrasts, the pertinent portion of the key previously used (Vol. 2, pp. 109, 110) is reproduced here and each group is discussed separately.

[1]For previous articles of this series see "Baileya" 2:103-113, 117-123 (1954). The fourth and final article, treating the Schoenoprasum and Alliotypus alliums, will appear in Vol. 3, no. 4 (December, 1955).

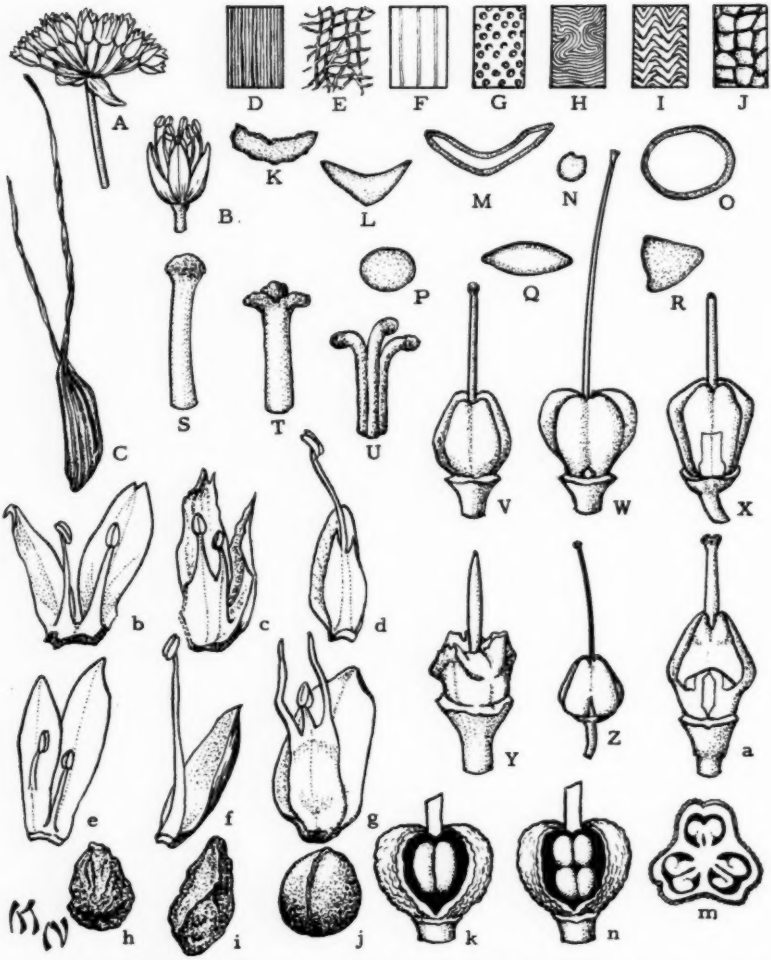


Fig. 49. Allium details: A, umbel, A. textile; B, flower, A. textile; C, spathe, A. pulchellum; D-J, portions of bulb-tunics much enlarged, D, A. ochroleucum; E, A. textile; F, A. cernuum; G, A. roseum; H, A. fibrillum; I, A. dichlamydeum; J, A. acuminatum; K-O, leaves in cross-section, K, A. pulchellum, L, A. Farreri; M, A. ramosum, N, A. flavescens, O, A. fistulosum; P-R, scapes in cross-section, P, A. rotundum, Q, A. senescens, R, A. triquetrum; S-U, stigmas, S, A. senescens, T, A. Farreri, U, A. triquetrum; V-Z, a, ovaries, V, A. ramosum, W, A. Schoenoprasum, X, A. cyaneum, Y, A. cernuum, Z, A. fistulosum, a, A. rotundum; b-g, stamens, b, A. ramosum, c, A. Farreri, d, A. nutans, e, A. triquetrum, f, A. pulchellum, g, A. rotundum; h-j, seeds, h, A. senescens, i, A. Schoenoprasum, j, A. tricoccum; k, n, ovaries with locule opened, k, A. senescens, n, A. Christophii; m, ovary in cross-section, A. Christophii.

4. Spathe strongly beaked, longer than the umbel; leaves successively sheathing the scape, sometimes to the middle. . III. The Codonoprason alliums

4. Spathe not strongly beaked, not exceeding the umbel; leaves mostly basal and divergent at the same level, rarely sheathing the scape in short succession.

5. Ovules 3-10 per locule. . . . . IV. The Melanocrommyum alliums

5. Ovules 2 per locule. . . . . V. The Molium alliums

III. The Codonoprason alliums

In Europe and Asia Minor there is a small but homogeneous and interesting series of alliums that was once known as section Macrospatha. They are now generally known as section Codonoprason G. Don ex Koch. Their most prominent feature is the long-beaked spathe that equals or usually overtops the umbel in bud and in flower (fig. 50c). The beak usually exceeds the base of the spathe in length and tears into two valves, one longer than the other. Except for this section, relatively few have a beaked spathe and then it is of more or less equal valves, and nectaries are present in the septs of the ovary. Nectaries are lacking in the Codonoprason alliums (fig. 50d). Other features are the small, ovate bulbs rarely borne on a slender inclined rhizome, sometimes clustered through division of the bulb but usually solitary, and the several leaves that clothe the scape in the lower third or half with a succession of tubular sheaths and spreading blades that wither as the flowers mature (fig. 50a). Bulb-tunics are not specialized, the inner being thin and membranous, the outer thickened and fibrous with parallel or interlocking, but not conspicuously netted, fibers (fig. 50b).

The seven species in the following key are grown or at least listed for sale in the United States.

Key to the cultivated Codonoprason alliums

1. Leaves and sheaths pilose. . . . . A. pilosum

1. Leaves and sheaths glabrous.

2. Umbels with bulbils replacing most of the flowers.

3. Flowers rose, with a dull bloom. . . . . A. carinatum

3. Flowers greenish to rosy, without a bloom. . . . . A. oleraceum

2. Umbels without bulbils.

4. Perianth always with a dull bloom, red-purple to lilac or yellowish with a rosy tinge; stamen-filaments 1 1/2 to 2 times as long as the perianth. . . . . A. pulchellum

4. Perianth without a bloom.

5. Flowers bright yellow; stamen-filaments 1 1/4 to 1 1/2 times as long as the perianth. . . . . A. flavum

5. Flowers rose or rose-tinged; stamen-filaments slightly shorter than to slightly longer than the perianth.

6. Perianth-segments pointed. . . . . A. frigidum

6. Perianth-segments blunt. . . . . A. paniculatum

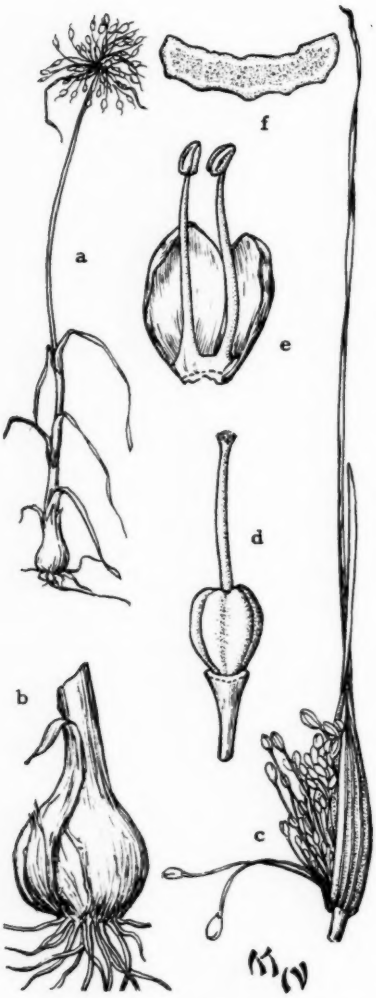


Fig. 50. Allium pulchellum: a, habit x 1/5; b, bulb x 1; c, umbel and spathe x 4/5; d, pistil x 4; e, stamens and perianth-segments x 4; f, cross-section of leaf.

Two species listed in the key are only doubtfully included. Plants from commercial sources going by the name of Allium frigidum have proved to be A. Schoenoprasum when grown at the Bailey Hortorium. True Allium frigidum, a rare species in the wild, is distinguished from the variable A. paniculatum by differences of the flower that are relatively minor. Allium pilosum has recently been offered for sale. No plants have been seen, but if they are correctly named they can readily be identified by the hairy leaves and sheath. The lilac flowers are borne on pedicels 2 to 3 times their length and have obtuse segments lacking the bloom of A. pulchellum. Plants are generally very low, with scapes only a few inches high.

Of the five species definitely cultivated in the United States, A. carinatum and A. oleraceum produce few flowers, most being replaced by bulbils. Allium oleraceum has become naturalized from eastern Pennsylvania to eastern Virginia and has sometimes been confused with A. carinatum. Because of their bulbiliferous habit, scant ornamental value, and tendency to become weedy they are not the most satisfactory species for the average gardener.

Allium flavum, A. paniculatum, and A. pulchellum, however, are definite additions to the garden. Allium flavum is one of the few yellow-flowered alliums. With its low stems less than a foot high, bluish-green foliage, and numerous bright flowers, it is a distinct

attraction in rock garden or perennial border. Two cultivars, 'Major' and 'Minor', are known, the latter being of dwarfer habit but not as small as the botanical var. minus of Boissier which is unknown in cultivation.

Allium pulchellum (fig. 50) is of taller habit, with a loose umbel. Flowers are usually red-purple but are sometimes yellowish with a rosy tinge and, like the more usual red-purple flowers, are dulled with a definite soft bloom. W. T. Stearn, writing on Old World alliums in "Herbertia" 11: 29 (1944) [1946], mentions two sorts. The ordinary plant grows about 1 to 1 1/2 feet high, has deep purple flowers, and dark anthers with yellow pollen. It flowers in early summer and produces abundant seed from capsules standing erect. The second sort is more robust, produces lilac or violet-rose flowers in late summer and seldom sets seed. Stearn suggested that it be called the Van Tubergen variety because it was apparently distributed by the Van Tubergen nurseries in Holland. Under the present Code this is better noted as A. pulchellum 'Van Tubergen'. Earlier names may one day be found to apply to this species but, for lack of adequate study, they cannot yet be taken up. Both sorts appear to be in American as well as in European gardens.

Last of the ornamental species, Allium paniculatum is similar in habit to A. pulchellum but has pale to deep pink or rose, dark-veined flowers lacking a bloom. Apparently A. paniculatum is infrequently cultivated with us but deserves inclusion in the allium collection.

IV. The Melanocrommyum alliums

From the dwarf Allium karataviense to such giants as Allium stipitatum and A. giganteum, members of the section Melanocrommyum are easily recognized by their numberous ovules. All of these do not necessarily mature into seeds, but they can be seen in flower by opening a locule of the ovary with a needle or fingernail (fig. 49n).

Some fifteen species of this group have been listed for sale in the United States. All of them have been included in the key that follows, although in practice it has been found that the names are frequently misapplied to such common species as A. Schoenoprasum or A. senescens.

Key to the cultivated Melanocrommyum alliums

1. Perianth-segments soon reflexed, withered after flowering and more or less twisted.
   2. Stamen-filaments shorter than the perianth-segments.
      3. Scape strongly ribbed; perianth 7 to 10 mm. long. . . A. Rosenbachianum
      3. Scape not strongly ribbed; perianth 6 to 8 mm. long.

4. Anthers yellow; perianth white or pale lilac with green midrib. . . . . A. nigrum

4. Anthers dark brown; perianth white to purple. . . . . A. Cyrillii

2. Stamen-filaments equalling or exceeding the perianth-segments.

5. Leaves hairy above and below. . . . . A. stipitatum

5. Leaves smooth or only the margin minutely roughened.

6. Margin of the leaf minutely toothed. . . . . A. Aschersonianum

6. Margin of the leaf smooth.

7. Perianth deep red or purplish to nearly black with darker midrib, the segments 4 to 5 mm. long. . . . . A. atropurpureum

7. Perianth rose to violet with darker midrib, the segments 6 to 8 mm. long.

8. Leaves broadly ovate or elliptic, 6 to 12 mm. wide, longer than the very short scape. . . . . A. karataviense

8. Leaves linear-lanceolate to strap-shaped, shorter than the very tall scape.

9. Leaves bluish; anthers violet, on filaments not joined with one another above their point of union with the perianth. . . . . A. aflatunense

9. Leaves more or less green; anthers yellow, on filaments that are more or less joined with one another above their point of union with the perianth. . . A. altissimum

1. Perianth-segments persistent and papery or spine-like, not reflexed, withered nor twisted after flowering.

10. Segments of the perianth rigid and spiny after flowering. . . A. Christophii

10. Segments of the perianth not rigid or spiny after flowering.

11. Pedicels thickened below the fruit, usually strongly unequal in length, with flowers borne in two distinct series. . . . . A. Schubertii

11. Pedicels not thickened below the fruit, more or less equal in length.

12. Stamen-filaments only slightly shorter than or up to 1 1/2 times as long as the perianth-segments, joined at the base only; perianth star-shaped or bell-shaped; leaves 2 to 10 cm. wide.

13. Scape strongly ribbed; perianth-segments 6 to 8 mm. long. . . . . A. elatum

13. Scape scarcely ribbed; perianth-segments 5 mm. long. . . . . A. giganteum

12. Stamen-filaments half as long as the perianth-segments or less, joined to the perianth for 1/2 to 2/3 their length; perianth narrowly bell-shaped; leaves 0.4 to 2.5 cm. wide.

14. Flowers rose-violet. . . . . A. Winklerianum

14. Flowers white. . . . . A. darwasicum

Alliums of the Melanocrommyum type, when obtained true to name, can be used in a number of ways. Allium karataviense, from Turkestan, a low species with short, broad leaves and a globose umbel of reddish flowers, is effective in the rock garden. Most of

the other species are much larger in size, hence are better adapted to the perennial garden or border. The great umbels of Allium Christophii, more commonly known as A. albopilosum (fig. 51), may measure nearly a foot across. The pale or metallic, persistent, spiny perianth-segments spread from the base of a short capsule that exposes black seeds when dry. After flowering in the garden, the umbels may be used for striking dried arrangements indoors. Allium nigrum and A. stipitatum are also known definitely to be cultivated in this country while it is to be hoped that others of the section will appear, in addition to those masquerading under their names.

V. The Molium alliums

Some of the most colorful and ornamental alliums appear in an assemblage of species that is considered here under the general heading of Molium alliums, taking its name from the section Molium G. Don ex Endlicher in which they have been placed at one time or another. They share many characters with the Melanocrommyum alliums but never have more than two ovules in each locule of the ovary (fig. 49k). Most of them are also much smaller in size, some, like A. Chamæmoly, being among the smallest in the genus.

From a botanical standpoint it is quite likely that this category should be subdivided, for it includes several diverse types that can be separated into

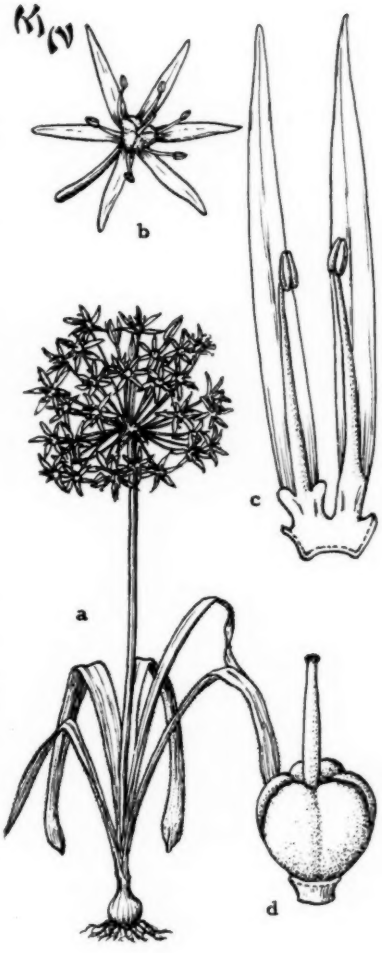


Fig. 51. Allium Christophii: a, habit x 1/5; b, flower x 1; c, stamens and perianth-segments x 4; d, pistil x 4.

sections on technical bases. In horticultural practice these technical differences are less important than the characters that hold them together: the usually solitary, well-formed bulbs, the few basal leaves that do not linger long after flowering, the ovary lacking open nectaries. Primary rhizomes on which the bulbs are seated are present in some of the Molium alliums but are seldom large or persistent, except in a few species such as A. cernuum. In addition to the primary rhizome, a secondary and transitory type is occasionally found. Here a daughter bulb is formed at the tip of a slender rhizome that emerges from the base of the bulb. Allium unifolium of California develops a rhizome of this nature.

That the Molium alliums are not uniform will be seen from the key to the species. The bulb-coat is fibrous-reticulate in a number of American species allied to A. canadense; a membranous bulb-coat, with or without the development of a distinctive pattern, characterizes the rest. Many species originating from and principally cultivated in western North America have highly patterned bulb-coats. Something of the same sort is found in the European Allium roseum and its relatives.

It is unfortunate that the differences between species are not only technical but hard to distinguish on casual examination. Any key would be simplified by the omission of our native alliums. Since they are cultivated and must be included, the key necessarily leans on technical differences, hence is not an easy one to use.

Key to the cultivated Molium alliums

1. Bulb-tunics fibrous-reticulate (fig. 49E).
   2. Umbels with bulbils replacing some or most of the flowers.
      3. Spathe-bracts 1-nerved; ovary with a crest (fig. 49Y). . . . . A. rubrum
      3. Spathe-bracts 3- to 7-nerved; ovary lacking a crest. . . . . A. canadense var. canadense
   2. Umbels without bulbils.
      4. Flowers bright yellow. . . . . A. Coryi
      4. Flowers white or pink.
         5. Ovary and capsule with a crest (fig. 49Y).
            6. Spathe-bracts 5- to 7-nerved.
               7. Flowers white. . . . . A. Cuthbertii
               7. Flowers pink. . . . . A. macropetalum
            6. Spathe-bracts 1-nerved.
               8. Flowers usually white; leaves usually 2 per scape; tips of the inner perianth-segments spreading. . . . . A. textile
               8. Flowers usually pink; leaves usually 3 or more per scape; inner perianth-segments erect. . . . . A. Geyeri

5. Ovary and capsule without a crest.

9. Bracts of spathe 1-nerved; fibers of bulb-tunic not separated except in age. . . . . A. Drummondii

9. Bracts of spathe 3- to 7-nerved; fibers of bulb-tunic separated.

10. Perianth urceolate, persistent about the fruit. . . . . A. perdulce

10. Perianth campanulate, withering in age.

11. Flowers colored; pedicels slender.

12. Bulblets borne at base of bulb; scape to 6 dm. high, the umbel with up to 175 lavender flowers. . . . . A. Zenobiæ

12. Bulblets lacking at base of bulb; scape to 3 dm. high, the umbel with fewer, pink flowers. . . . . A. canadense var. mobilense

11. Flowers white; pedicels stoutish. . . . . A. canadense var. Fraseri

1. Bulb-tunics membranous or coriaceous, often pitted or intricately patterned.

13. Stigma deeply 3-lobed (fig. 49U); scape 3-angled (fig. 49R); seeds with an aril. . . . . A. triquetrum

13. Stigma entire or very shortly 3-lobed (fig. 49 S, T); scape terete or 2-angled (fig. 49 P, Q); seeds without an aril.

14. Flowers bright yellow. . . . . A. Moly

14. Flowers white, yellowish-white with pink veins, pink, rose or purple.

15. Scape very short, the pedicels and the scape recurved in fruit; leaves pilose. . . . . A. Chamæmoly

15. Scape generally more or less well-developed, not recurved in fruit; pedicels straight in fruit; leaves generally glabrous.

16. Leaf solitary, terete, longer than the scape; ovary crested.

17. Stigmas entire or obscurely lobed.

18. Stamens half as long as the perianth. . . A. atrorubens

18. Stamens nearly as long as the perianth. . . A. Parishii

17. Stigmas with 3 short, slender lobes.

19. Crests of the ovary fringed. . . . . A. fimbriatum

19. Crests of the ovary acute or acuminate but not ed. . . . . A. Purdyi

16. Leaves 2 or more, flat or concave-convex; ovary with or without crests.

20. Ovary with 3 or 6 prominent crests at the top.

21. Outer bulb-tunics lacking a distinctive pattern of meshes or reticulations.

22. Scape flattened, 2-edged, short (usually less than 10 cm. high) and exceeded by the leaves.

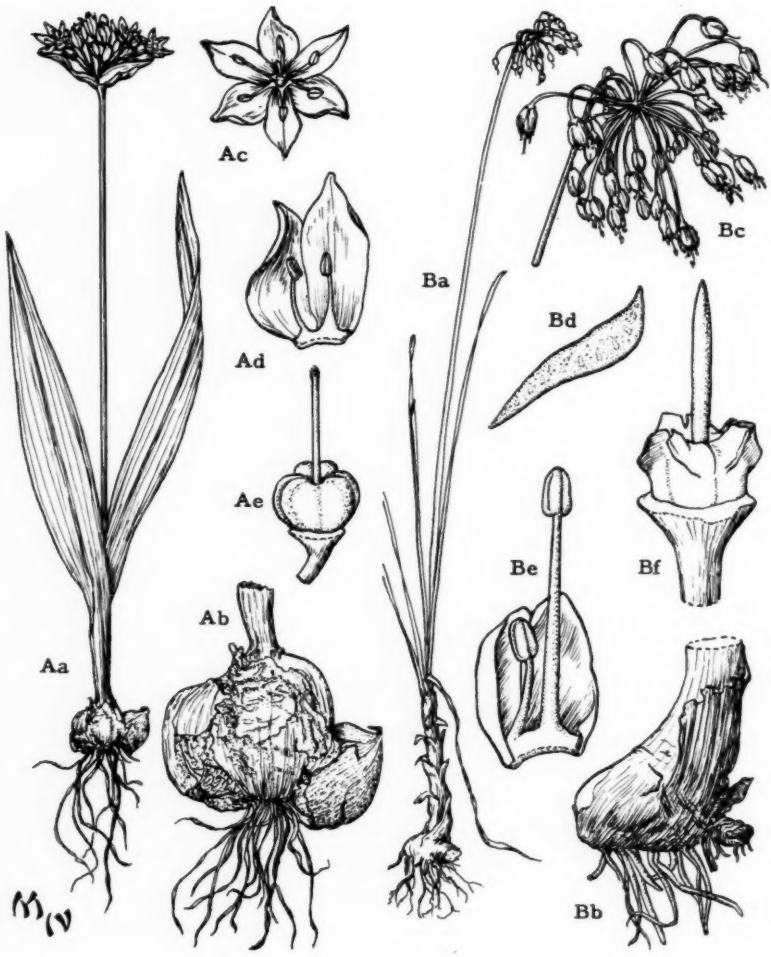


Fig. 52. A, Allium Moly: a, habit x 1/4; b, bulb x 1; c, flower x 1; d, stamens and perianth-segments x 2; e, pistil x 4. B, Allium cernuum: a, habit x 1/5; b, bulb x 1; c, umbel x 4/5; d, cross-section of leaf x 4; e, stamens and perianth-segments x 4; f, pistil x 6.

23. Ovary with 3 crests. . . . . A. falcifolium

23. Ovary with 6 crests.

24. Margins of the scape smooth and entire. . . . . A. Tolmiei

24. Margins of the scape minutely toothed. . . . . A. crenulatum

22. Scape rounded, ridged, only slightly 2-edged at most, usually more than 15 cm. high, the leaves shorter than the scape or equalling it.

25. Stamens included within the perianth. . . . . A. hæmatochiton

25. Stamens exserted from the perianth.

26. Umbel permanently nodding, the campanulate flowers on flexuous pedicels (fig. 52Bc); leaves thin. . . . . A. cernuum

26. Umbel erect in flower, the star-like flowers on stiff pedicels; leaves thick, hard, convex on the back. . . . . A. stellatum

21. Outer bulb-tunics with a prominent pattern of meshes or reticulations.

27. Pattern of tunics consisting of transverse, linear, V-shaped meshes appearing in saw-tooth rows (fig. 49I).

28. Bracts of the spathe scarcely 1 cm. long, rounded and short-pointed at the tip. . . . . A. amplectans

28. Bracts of the spathe 1.5 to 2.5 cm. long, long-pointed.

29. Perianth-segments broadly oblong-ovate, coming to an abrupt point. . . . . A. dichlamydeum

29. Perianth-segments ovate-lanceolate, gradually pointed.

30. Margin of inner perianth-segments conspicuously toothed or with minute glandular teeth. . . . . A. Bolanderi

30. Margin of inner perianth-segments entire.

31. Pedicels 8 to 15 mm. long; perianth-segments more or less equal. . . . . A. serratum

31. Pedicels 15 to 20 mm. long; outer perianth-segments twice as wide as the inner. . . . . A. peninsulare

27. Pattern of tunics regular, the reticulations sometimes sinuous but not V-shaped.

32. Ovary with 3 crests; bulb-tunics with coarse shallow pits (fig. 49J).

33. Inner perianth-segments minutely toothed. . . . . A. acuminatum

33. Inner perianth-segments entire. . . . . A. lacunosum

32. Ovary with 6 crests; bulb-tunics with fine meshes.

34. Perianth-segments broadly ovate-lanceolate, thin and spreading; stamens about 3/4 as long as the perianth. . . . . A. campanulatum

34. Perianth-segments lanceolate or narrowly ovate-lanceolate, acute or acuminate, not thin or spreading; stamen-filaments nearly or quite as long as the perianth. . . . . A. Nevii

20. Ovary without crests (though sometimes obscurely ridged in A. fibrillum and A. Lemmonii).
    35. Bulb-tunics with V-shaped or sinuous oblong meshes in sawtooth rows (fig. 49I).
        36. Perianth-segments 9 to 10 mm. long, white with deeply colored midvein. . . . . A. praecox
        36. Perianth-segments 10 to 14 mm. long, rose-colored. . A. unifolium
    35. Bulb-tunics with obscure or round or contorted patterning (fig. 49 G, H).
        37. Outer bulb-tunics with deep round pits; flowers papery (fig. 49 G). . . . . A. roseum
        37. Outer bulb-tunics not pitted.
            38. Perianth deep purple; style strongly exserted. . . A. macranthum
            38. Perianth white to rose or, if deeper, then the style included.
                39. Perianth white with obtuse papery segments 10 mm. long or more. . . . . A. neapolitanum
                39. Perianth colored or, if white, with pointed segments less than 10 mm. long.
                    40. Leaves hairy or ciliate; perianth-segments white, withering in fruit. . . . . A. subhirsutum
                    40. Leaves glabrous; perianth-segments thickened around the fruit, colored at least on the midnerve.
                        41. Scape short, less than 15 cm. high.
                            42. Leaves broad, 8 to 12 mm. wide. . . . A. libanii
                            42. Leaves narrow, 2 to 4 mm. wide.
                                43. Bulb-tunics without definite reticulations. . . . . A. parvum
                                43. Bulb-tunics with a distinctive pattern of meshes.
                                    44. Pattern of tunic of rounded meshes. . . . . A. oreophilum
                                    44. Pattern of rectangular or contorted meshes (fig. 49H).
                                        45. Stamens about 1/2 as long as the perianth; bulb-tunic with contorted sculpturing. . A. fibrillum
                                        45. Stamens nearly equalling the perianth; bulb-tunic with rectangular sculpturing. . A. Lemmonii
                        41. Scape taller, 15 cm. high or more.
                            46. Perianth-segments 10 to 14 mm. long, with a long sharp point; leaves 1 to 2 cm. wide. . . . . A. platycaule
                            46. Perianth-segments 6 to 8 mm. long or, if sometimes longer, then the leaves less than 1 cm. wide and the segments not long-pointed.

47. Pedicels 1 to 2 times as long as the flowers. . . . . A. zebdanense
47. Pedicels 2 to 3 times as long as the flowers.
48. Stamen-filaments about 1/3 as long as perianth. . . . . A. Ostrowskianum
48. Stamen-filaments nearly equalling the perianth.
49. Style exserted; leaves 2. . . . . A. Douglasii
49. Style included; leaves several. . . . . A. Kunthii

Probably no other single group of alliums encompasses so many that adapt themselves to use in the rock garden. Very many of the Molium group are of low stature and some are decidedly dwarf. By and large they bloom from early to late spring, though a few of the coarser species, including A. cernuum and A. stellatum, do not flower until midsummer. As with so many bulbous plants, their vegetative period is relatively short and they do not offer competition to later replacements in the flowering schedule.

Most dwarf of all is Allium Chemæmoly, a true miniature with the interesting habit of reflexing the scape and fruiting pedicels. Many of our western alliums, A. acuminatum, A. crenulatum, A. Tolmiei, and the like, are less than 15 centimeters high. Those species with fibrous-reticulate bulb-coats tend to be somewhat more coarse, and several species are suitable for the perennial garden or border because of their height. Such are A. Moly (fig. 52A), A. cernuum (fig. 52B), A. stellatum, A. neapolitanum, A. roseum, A. macranthum, and A. Ostrowskianum. Allium triquetrum is a woodland species desirable for semi-shaded areas.

Book Reviews

"Some Beautiful Indian Trees" by Blatter, E., and Millard, W. S. Second edition. Revised by W. T. Stearn. 165 pp., 31 col. pl., 47 photographic reproductions, Bombay Natural History Society, 114 Apollo St., Bombay, India ([March 3] 1955). British agent: Wheldon & Wesley Ltd., 83/84 Berwick St., London, W 1. Price, 30 shillings Sterling.

The number of authentic reference works devoted to the more showy trees suited for gardens in the warmer parts of this country, not to mention Hawaii and the Caribbean, is too few. This new edition of a work first published in 1939 is most welcome because of its accuracy, scholarly character, and quality color printing. The revision has been prepared by William T. Stearn, formerly librarian of the R. H. S. Lindley Library, now a member of the botanical staff at the British Museum of Natural History, and exemplifies the meticulous attention that has made his horticultural and botanical writings so valuable.

The book provides descriptive and well-illustrated selections of 31 kinds of trees cultivated in, though not all native to, India, almost all of which are in the American trade. The color work is greatly improved in this edition by the use of a high quality coated paper, and the text made more easily read by casting in a larger type-face of superior design.

The arrangement is alphabetical by Latin name, with carefully compiled historical, distributional, cultural, and economic information given for each species, in addition to the description. In this edition the English-language name accepted in "Standardized Plant Names" (which often, however, is not the common name of the tree in this country) is provided as a supplement to a very complete listing of regional vernacular names of India. In this edition, Mr. Stearn has added full citations for the original publication of each valid name and has also included important synonyms and one or more sources of other illustrations.

Critical students of tropical ornamental trees will welcome Stearn's taxonomic notes on Firmiana colorata and its relatives, Colvillea racemosa, Jacaranda mimosifolia (J. acutifolia), and Salmalia malabarica (Bombax malabaricum). Among the valued additions to this revision are the five appendices, which provide:

Descriptions of families represented
A key to the genera
Changes in nomenclature
Glossary of some botanical terms
Some sources of further information [a selected bibliography]

Persons acquiring the book will wish to transfer to appropriate pages the corrections on the corrigenda slip, and note should be made of the change in name of Peltophorum Roxburghii (G. Don) Degener to P. pterocarpum (DeCandolle) Backer. This was treated erroneously in "Hortus Second" as P. inerme. The presence of one new combination, Salmalia scopulorum (Dunn) W. T. Stearn

(based on Bombax scopulorum) on p. 128, gives emphasis to the importance of the correction in publication date of the book (as noted in Mr. Stearn's presentation copy to the Bailey Hortorium), which should be March 3, 1955, and not "1954" as given on the verso of the title-page.

G. H. M. L.

"Weeds" by Walter Conrad Muenscher. Second edition, 560 pp., 135 fig. The Macmillan Company, New York, 1955. Price, $10.00.

When a horticulturist - farmer, nurseryman, or back-yard gardener - is not using all his wiles to induce certain plants to germinate, grow, and flower and fruit abundantly, he is directing his time and efforts toward preventing other plants from doing the same. That is why every plantsman will be concerned with weeds as well as plant treasures.

One is frequently surprised by the misconceptions many people entertain about the nature of a weed. Unless one is strictly a zinnia-petunia-peony-and-iris type of gardener, one must at least once or twice have been asked the question, "But why are you growing that? Isn't that just a weed?" It is a matter of one man's darling's being another man's weed. The term "weed" has been defined many times, both succinctly and at length, but Dr. Muenscher's is as serviceable as any I have encountered:

> Weeds are those plants with harmful or objectionable habits or characteristics, which grow where they are not wanted, usually in places where it is desired that something else should grow. Strictly speaking, there are no species of weeds. Whether a plant of a given species is considered a weed depends not only on its characteristics and habits but also on its relative position with reference to other plants and man.

This new edition of Dr. Muenscher's "Weeds" is even more comprehensive than the first (published in 1935), containing ample descriptions of 571 species of weeds, 71 of these being new to this revision. The geographical range this work is intended to cover is the northern United States and Canada, but it will be useful also farther south, for many weeds are far-ranging. Weeds restricted to the south are not treated, however. Most strictly aquatic weeds, such as species of Elodea, Nymphæa, Nuphar, Trapa are not included, though they are occasionally abundant and undesirable weeds in certain situations.

"Weeds" will be found valuable primarily for identifying and naming weeds. The arrangement of the various species is by families, following the Engler system, and within the families the species are arranged alphabetically by scientific name. Synonymous scientific names as well as common names are given also. For each there is brief information on its habit, habitat, and range, fol-

lowed by a good concise description of the plant. Supplementing this are carefully drawn and attractive figures of 331 of the weeds mentioned.

This main, descriptive body of the work is preceded by a dichotomous key to all the species, by means of which any weed described in the later text may be keyed out and identified. The key is necessarily rather technical in language, but there is a good glossary to all the technical terms which will ameliorate the difficulties for non-botanically trained users.

One criticism which one might make of the key is that the general index at the end of the book does not include page-references to species-names as they occur in the key. With a specimen of unknown identity in hand, one may often know the genus to which it belongs but not recognize the particular species. In such cases, it would be convenient and time-saving to be able to locate easily the part of the key in which the species of that particular genus are distinguished. Without such an aid, one must run through the key from the beginning, or thumb through it until the desired genus is located.

Methods of control are given briefly for each species described, with numbered references to more ample treatments or methods in the special chapter "The Control of Weeds." Contrary to what the publishers' summary states, on the flap of the dust-jacket, modern methods of chemical control are not included. Instead, a list of references to recent literature on the new chemical weed-controls is given for those interested. This is a sensible treatment of such a subject in a book of this type, for though the main body of the work concerning the weeds themselves will be of continuing value and usefulness for many years to come, the chemical control of weeds is in such a state of constant change and improvement that any lengthy discussion of the topic is outdated soon after it is published.

A rather important omission was made in the directions for the control of species of Rhus (poison ivy and poison sumac). Neither with the particular species nor under the subheading of "Burning" in the chapter on the control of weeds is the warning given against burning poison ivy and sumac. Since it is inadvisable to handle these plants, it is only natural for most would-be eradicators to consider burning them a good alternative, and for this reason, I feel, specific warning should be given against such practice. The poisonous oil is volatile and, carried in the smoke from burning plants, has been known to cause severe cases of poisoning in persons even a little distance away from the fire itself.

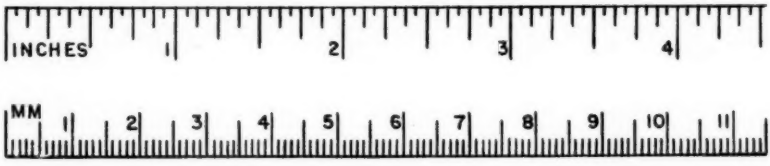
Chapters on the dissemination and importance of weeds and on weeds of special habitats (containing numerous lists and tables) and an extensive bibliography complete this volume. Certainly no one whose work involves the identification of weeds can afford to be without it and most gardeners with a natural curiosity about plants in general will want to own copies, too, of this nearly encyclopedic work on these outcasts of the horticultural world.

W. J. D.

ABBREVIATIONS USED IN BAILEYA

[Excluding abbreviations of author's names following binomials etc.]

ann.	annual	dm.	decimeter	lf.	leaf
bien.	biennial	fl.	flower	lft.	leaflet
br.	branch	fls.	flowers	lvs.	leaves
brt.	branchlet	flt.	floret	mm.	millimeter
caps.	capsule	fr.	fruit	per.	perennial
cl.	clone	ft.	foot	segm.	segment
cm.	centimeter	hort.	horticultural	st.	stem
cv.	cultivar	in.	inch	sts.	stems
diam.	diameter	infl.	inflorescence	var.	variety

METRIC - ENGLISH EQUIVALENTS (approximate)

6 mm. - 1/4 in.	10 cm. - 4 in.	10 mm. - 1 cm.
12 mm. - 1/2 in.	1 dm. - 4 in.	10 cm. - 1 dm.
25 mm. - 1 in.	3 dm. - 1 ft.	10 dm. - 1 meter
2.5 cm. - 1 in.	10 dm. - 1 yd.	
5 cm. - 2 in.	1 m. - 39 in.